In the Claims

Please replace all prior versions of claims in the application with the following claims. Claims 1, 2, 4, 7, 8, 10-12, 15, 16, 18, 19, 24-27, 29, 30, 32, 37-39 and 41 are cancelled.

1.-2.   (Cancelled)

3.   (Previously presented) A method for controlling the rates of concurrent digital transmissions using at least first and second queues having a plurality of locations, said method comprising the steps of:

for each transmission of high priority, writing an index corresponding to a data cell of the high-priority transmission at one of the locations in the first queue;

writing in the same way into the second queue indexes corresponding to transmissions of lower priority;

successively surveying the locations of the first queue at a rate corresponding to a cell transmission rate;

if the surveyed location in the first queue contains an index, transmitting the corresponding data cell, freeing the surveyed location, and rewriting the index at the location in the first queue that is distant from the surveyed location in the first queue by a value determined by the rate of the corresponding transmission;

successively surveying the locations of the second queue;

if the surveyed location in the second queue contains an index, transmitting the corresponding data cell when the surveyed location in the first queue does not contain an index, freeing the surveyed location in the second queue and rewriting the index at the location in the second queue that is distant from said surveyed location in the second queue by a value determined by the rate of the corresponding transmission;

interrupting the surveying of the first queue when the number of indexes in the first queue reaches a predetermined limit;

resuming the surveying of the first queue when a rate pointer is incremented;

writing a ghost index into at least one of the locations in the first queue; and

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if the surveyed location in the first queue contains a ghost index, freeing the surveyed location and rewriting the ghost index at one of the locations in the first queue.

4.   (Cancelled)

5.   (Previously presented) A method for controlling the rates of concurrent digital transmissions using at least first and second queues having a plurality of locations, said method comprising the steps of:

for each transmission of high priority, writing an index corresponding to a data cell of the high-priority transmission at one of the locations in the first queue;

writing in the same way into the second queue indexes corresponding to transmissions of lower priority;

successively surveying the locations of the first queue at a rate corresponding to a cell transmission rate;

if the surveyed location in the first queue contains an index, transmitting the corresponding data cell, freeing the surveyed location, and rewriting the index at the location in the first queue that is distant from the surveyed location in the first queue by a value determined by the rate of the corresponding transmission;

successively surveying the locations of the second queue;

if the surveyed location in the second queue contains an index, transmitting the corresponding data cell when the surveyed location in the first queue does not contain an index, freeing the surveyed location in the second queue and rewriting the index at the location in the second queue that is distant from said surveyed location in the second queue by a value determined by the rate of the corresponding transmission;

writing a ghost index into at least one of the locations in the first queue; and

if the surveyed location in the first queue contains a ghost index, freeing the surveyed location and rewriting the ghost index at one of the locations in the first queue.

6.   (Original) The method of claim 5, wherein the ghost index is rewritten at a random distance from the surveyed location.

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7.-8.   (Cancelled)

9.   (Previously presented) A method for controlling the rates of concurrent digital

transmissions using at least first and second queues having a plurality of locations, said method

comprising the steps of:

for each transmission, writing an index corresponding to a data cell of the transmission at

one of the locations in the first queue and/or the second queue;

successively surveying the locations of the first queue at a higher rate than a cell

transmission rate;

successively surveying the locations of the second queue;

if the surveyed location in the first queue contains an index, transmitting the

corresponding data cell, freeing the surveyed location, and rewriting the index at the location in

the first queue that is distant from the surveyed location by a predetermined value;

interrupting the surveying of the first queue when the location indicated by a rate pointer

is reached;

incrementing the rate pointer by N locations at the transmission rate of N cells; and

if the surveyed location in the second queue contains an index, transmitting the

corresponding data cell when the surveyed location in the first queue does not contain an index

or when the surveying of the first queue is interrupted.

10.-12. (Cancelled)

13.   (Previously presented) A machine-readable medium encoded with a program for

controlling the rates of concurrent digital transmissions using at least first and second queues

having a plurality of locations, said program containing instructions for performing the steps of:

for each transmission of high priority, writing an index corresponding to a data cell of the

high-priority transmission at one of the locations in the first queue;

writing in the same way into the second queue indexes corresponding to transmissions of

lower priority;

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successively surveying the locations of the first queue at a rate corresponding to a cell transmission rate;

if the surveyed location in the first queue contains an index, transmitting the corresponding data cell, freeing the surveyed location, and rewriting the index at the location in the first queue that is distant from the surveyed location in the first queue by a value determined by the rate of the corresponding transmission;

successively surveying the locations of the second queue;

if the surveyed location in the second queue contains an index, transmitting the corresponding data cell when the surveyed location in the first queue does not contain an index, freeing the surveyed location in the second queue and rewriting the index at the location in the second queue that is distant from said surveyed location in the second queue by a value determined by the rate of the corresponding transmission;

interrupting the surveying of the first queue when the number of indexes in the first queue reaches a predetermined limit;

resuming the surveying of the first queue when a rate pointer is incremented;

writing a ghost index into at least one of the locations in the first queue; and

if the surveyed location in the first queue contains a ghost index, freeing the surveyed location and rewriting the ghost index at one of the locations in the first queue.

14.   (Previously presented) A machine-readable medium encoded with a program for controlling the rates of concurrent digital transmissions using at least first and second queues having a plurality of locations, said program containing instructions for performing the steps of:

for each transmission of high priority, writing an index corresponding to a data cell of the high-priority transmission at one of the locations in the first queue;

writing in the same way into the second queue indexes corresponding to transmissions of lower priority;

successively surveying the locations of the first queue at a rate corresponding to a cell transmission rate;

if the surveyed location in the first queue contains an index, transmitting the corresponding data cell, freeing the surveyed location, and rewriting the index at the location in

the first queue that is distant from the surveyed location in the first queue by a value determined by the rate of the corresponding transmission;

successively surveying the locations of the second queue;

if the surveyed location in the second queue contains an index, transmitting the corresponding data cell when the surveyed location in the first queue does not contain an index, freeing the surveyed location in the second queue and rewriting the index at the location in the second queue that is distant from said surveyed location in the second queue by a value determined by the rate of the corresponding transmission;

writing a ghost index into at least one of the locations in the first queue; and

if the surveyed location in the first queue contains a ghost index, freeing the surveyed location and rewriting the ghost index at one of the locations in the first queue.

15.-16. (Cancelled)

17.   (Previously presented) A machine-readable medium encoded with a program for controlling the rates of concurrent digital transmissions using at least first and second queues having a plurality of locations, said program containing instructions for performing the steps of:

for each transmission, writing an index corresponding to a data cell of the transmission at one of the locations in the first queue and/or the second queue;

successively surveying the locations of the first queue at a higher rate than a cell transmission rate;

successively surveying the locations of the second queue;

if the surveyed location in the first queue contains an index, transmitting the corresponding data cell, freeing the surveyed location, and rewriting the index at the location in the first queue that is distant from the surveyed location by a predetermined value;

interrupting the surveying of the first queue when the location indicated by a rate pointer is reached;

incrementing the rate pointer by N locations at the transmission rate of N cells; and

if the surveyed location in the second queue contains an index, transmitting the corresponding data cell when the surveyed location in the first queue does not contain an index or when the surveying of the first queue is interrupted.

18.-19. (Cancelled)

20.   (Previously presented) A method for controlling rates of concurrent digital transmissions, comprising:

using at least first and second queues, each having a plurality of locations;

for each transmission of relatively high priority, writing an index corresponding to a data cell of the relatively high priority transmission in one of the locations in the first queue;

for each transmission of relatively low priority, writing an index corresponding to a data cell of the relatively low priority transmission in one of the locations in the second queue;

successively accessing the locations in the first queue at a rate corresponding to a cell transmission rate;

if the accessed location in the first queue contains an index, transmitting the corresponding data cell, freeing the accessed location, and rewriting the index at a location in the first queue that is distant from the accessed location in the first queue by a value determined by the rate of the corresponding transmission;

successively accessing the locations in the second queue; and

if the accessed location in the second queue contains an index, transmitting the corresponding data cell when the accessed location in the first queue does not contain an index, freeing the accessed location in the second queue and rewriting the index at a location in the second queue that is distant from the accessed location in the second queue by a value determined by the rate of the corresponding transmission;

wherein the index is rewritten in the first queue at a distance from the accessed location that is inversely proportional to the rate of the corresponding transmission.

21.   (Previously presented) A method for controlling rates of concurrent digital transmissions, comprising:

using at least first and second queues, each having a plurality of locations;

for each transmission of relatively high priority, writing an index corresponding to a data cell of the relatively high priority transmission in one of the locations in the first queue;

for each transmission of relatively low priority, writing an index corresponding to a data cell of the relatively low priority transmission in one of the locations in the second queue;

successively accessing the locations in the first queue at a rate corresponding to a cell transmission rate;

if the accessed location in the first queue contains an index, transmitting the corresponding data cell, freeing the accessed location, and rewriting the index at a location in the first queue that is distant from the accessed location in the first queue by a value determined by the rate of the corresponding transmission;

successively accessing the locations in the second queue;

if the accessed location in the second queue contains an index, transmitting the corresponding data cell when the accessed location in the first queue does not contain an index, freeing the accessed location in the second queue and rewriting the index at a location in the second queue that is distant from the accessed location in the second queue by a value determined by the rate of the corresponding transmission;

associating a first cell pointer with the first queue and a second cell pointer with the second queue;

incrementing each cell pointer when the respective accessed location is not occupied;

incrementing one of the cell pointers when the corresponding data cell is transmitted; and

not incrementing the second cell pointer when the accessed locations in the first and second queues are both occupied.

22.   (Previously presented) A method as defined in claim 21, wherein the first and second cell pointers are incremented at different rates that correspond to the passbands assigned to the types of connections associated with the first and second queues.

23.   (Previously presented) A method for controlling rates of concurrent digital transmissions, comprising:

using at least first and second queues, each having a plurality of locations;

for each transmission of relatively high priority, writing an index corresponding to a data cell of the relatively high priority transmission in one of the locations in the first queue;

for each transmission of relatively low priority, writing an index corresponding to a data cell of the relatively low priority transmission in one of the locations in the second queue;

successively accessing the locations in the first queue at a rate corresponding to a cell transmission rate;

if the accessed location in the first queue contains an index, transmitting the corresponding data cell, freeing the accessed location, and rewriting the index at a location in the first queue that is distant from the accessed location in the first queue by a value determined by the rate of the corresponding transmission;

successively accessing the locations in the second queue;

if the accessed location in the second queue contains an index, transmitting the corresponding data cell when the accessed location in the first queue does not contain an index, freeing the accessed location in the second queue and rewriting the index at a location in the second queue that is distant from the accessed location in the second queue by a value determined by the rate of the corresponding transmission;

writing a ghost index into at least one of the locations in the first queue; and

if the accessed location in the first queue contains a ghost index, freeing the accessed location and rewriting the ghost index in the first queue at a random distance from the accessed location.

24.-27. (Cancelled)

28.   (Previously presented) A method for controlling rates of concurrent digital transmissions, comprising:

using at least first and second queues, each having a plurality of locations;

for each transmission, writing an index corresponding to a data cell of the transmission in one of the locations in the first queue or the second queue;

successively accessing the locations of the first queue at a higher rate than a cell transmission rate;

successively accessing the locations of the second queue;

if the accessed location in the first queue contains an index, transmitting the corresponding data cell, freeing the accessed location, and rewriting the index at a location in the first queue that is distant from the accessed location by a predetermined value;

interrupting the accessing of the first queue when a location indicated by a rate pointer is reached;

incrementing the rate pointer by N locations at the transmission rate of N cells; and

if the accessed location in the second queue contains an index, transmitting the corresponding data cell when the accessed location in the first queue does not contain an index or when the accessing of the first queue is interrupted.

29.-30. (Cancelled)

31.   (Previously presented) A method for controlling rates of concurrent digital transmissions, comprising:

using a queue having a plurality of locations;

for each transmission, writing an index corresponding to a data cell of the transmission at one of the locations in the queue;

successively accessing the locations of the queue at a rate corresponding to a cell transmission rate;

if the accessed location in the queue contains an index, transmitting the corresponding data cell, freeing the accessed location, and rewriting the index at a location in the queue that is distant from the accessed location by a value determined by the rate of the corresponding transmission;

writing a ghost index into at least one of the locations in the queue; and

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if the accessed location in the queue contains a ghost index, freeing the accessed location and rewriting the ghost index in the queue at a random distance from the accessed location.

32.   (Cancelled)

33.   (Previously presented) Apparatus for controlling rates of concurrent digital transmissions, comprising:

a memory having defined therein at least first and second queues, each having a plurality of locations; and

a controller including:

means, for each transmission of relatively high priority, for writing an index corresponding to a data cell of the relatively high priority transmission in one of the locations in the first queue;

means, for each transmission of relatively low priority, for writing an index corresponding to a data cell of the relatively low priority transmission in one of the locations in the second queue;

means for successively accessing the locations in the first queue at a rate corresponding to a cell transmission rate;

means, if the accessed location in the first queue contains an index, for transmitting the corresponding data cell, for freeing the accessed location and for rewriting the index at a location in the first queue that is distant from the accessed location in the first queue by a value determined by the rate of the corresponding transmission;

means for successively accessing the locations in the second queue; and

means, if the accessed location in the second queue contains an index, for transmitting the corresponding data cell when the accessed location in the first queue does not contain an index, for freeing the accessed location in the second queue and for rewriting the index at a location in the second queue that is distant from the accessed location in the second queue by a value determined by the rate of the corresponding transmission, wherein the index is rewritten in the first queue at a distance from the

accessed location that is inversely proportional to the rate of the corresponding

transmission.

34.   (Previously presented) Apparatus for controlling rates of concurrent digital

transmissions, comprising:

a memory having defined therein at least first and second queues, each having a plurality

of locations; and

a controller including:

means, for each transmission of relatively high priority, for writing an index

corresponding to a data cell of the relatively high priority transmission in one of the

locations in the first queue;

means, for each transmission of relatively low priority, for writing an index

corresponding to a data cell of the relatively low priority transmission in one of the

locations in the second queue;

means for successively accessing the locations in the first queue at a rate

corresponding to a cell transmission rate;

means, if the accessed location in the first queue contains an index, for

transmitting the corresponding data cell, for freeing the accessed location and for

rewriting the index at a location in the first queue that is distant from the accessed

location in the first queue by a value determined by the rate of the corresponding

transmission;

means for successively accessing the locations in the second queue;

means, if the accessed location in the second queue contains an index, for

transmitting the corresponding data cell when the accessed location in the first queue

does not contain an index, for freeing the accessed location in the second queue and for

rewriting the index at a location in the second queue that is distant from the accessed

location in the second queue by a value determined by the rate of the corresponding

transmission;

means for associating a first cell pointer with the first queue and a second cell

pointer with the second queue;

means for incrementing each cell pointer when the respective accessed location is not occupied;

means for incrementing one of the cell pointers when the corresponding data cell is transmitted; and

means for not incrementing the second cell pointer when the accessed locations in the first and second queues are both occupied.

35.   (Previously presented) Apparatus as defined in claim 34, wherein the first and second cell pointers are incremented at different rates that correspond to the passbands assigned to the types of connections associated with the first and second queues.

36.   (Previously presented) Apparatus for controlling rates of concurrent digital transmissions, comprising:

a memory having defined therein at least first and second queues, each having a plurality of locations; and

a controller including:

means, for each transmission of relatively high priority, for writing an index corresponding to a data cell of the relatively high priority transmission in one of the locations in the first queue;

means, for each transmission of relatively low priority, for writing an index corresponding to a data cell of the relatively low priority transmission in one of the locations in the second queue;

means for successively accessing the locations in the first queue at a rate corresponding to a cell transmission rate;

means, if the accessed location in the first queue contains an index, for transmitting the corresponding data cell, for freeing the accessed location and for rewriting the index at a location in the first queue that is distant from the accessed location in the first queue by a value determined by the rate of the corresponding transmission;

means for successively accessing the locations in the second queue;

means, if the accessed location in the second queue contains an index, for transmitting the corresponding data cell when the accessed location in the first queue does not contain an index, for freeing the accessed location in the second queue and for rewriting the index at a location in the second queue that is distant from the accessed location in the second queue by a value determined by the rate of the corresponding transmission;

means for writing a ghost index into at least one of the locations in the first queue; and

means, if the accessed location in the first queue contains a ghost index, for freeing the accessed location and for rewriting the ghost index in the first queue at a random distance from the accessed location.

37.-39. (Cancelled)

40.   (Previously presented) Apparatus for controlling rates of concurrent digital transmissions, comprising:

a memory having defined therein at least first and second queues, each having a plurality of locations; and

a controller including:

means, for each transmission, for writing an index corresponding to a data cell of the transmission in one of the locations in the first queue or the second queue;

means for successively accessing the locations of the first queue at a higher rate than a cell transmission rate;

means for successively accessing the locations of the second queue;

means, if the accessed location in the first queue contains an index, for transmitting the corresponding data cell, for freeing the accessed location, and for rewriting the index at a location in the first queue that is distant from the accessed location by a predetermined value;

means for interrupting the accessing of the first queue when a location indicated by a rate pointer is reached;

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means for incrementing the rate pointer by N locations at the transmission rate of N cells; and

means, if the accessed location in the second queue contains an index, for transmitting the corresponding data cell when the accessed location in the first queue does not contain an index or when the accessing of the first queue is interrupted.

41.   (Cancelled)

42.   (Previously presented) Apparatus for controlling rates of concurrent digital transmissions, comprising:

a memory having defined therein at least first and second queues, each having a plurality of locations; and

a controller including:

means, for each transmission, for writing an index corresponding to a data cell of the transmission in one of the locations in the first queue or the second queue;

means for successively accessing the locations of the first queue at a higher rate than a cell transmission rate;

means for successively accessing the locations of the second queue;

means, if the accessed location in the first queue contains an index, for transmitting the corresponding data cell, for freeing the accessed location, and for rewriting the index at a location in the first queue that is distant from the accessed location by a predetermined value;

means for interrupting the accessing of the first queue when a location indicated by a rate pointer is reached;

means for incrementing the rate pointer by N locations at the transmission rate of N cells;

means for interrupting the accessing of the first queue when the number of indexes in the first queue reaches a predetermined limit; and

means for resuming the accessing of the first queue when the rate pointer is incremented.

43.   (Previously presented) Apparatus for controlling rates of concurrent digital
transmissions, comprising:

   a memory having defined therein a queue having a plurality of locations; and

   a controller including:

        means, for each transmission, for writing an index corresponding to a data cell of
the transmission at one of the locations in the queue;

        means for successively accessing the locations of the queue at a rate
corresponding to a cell transmission rate;

        means, if the accessed location in the queue contains an index, for transmitting the
corresponding data cell, for freeing the accessed location, and for rewriting the index at a
location in the queue that is distant from the accessed location by a value determined by
the rate of the corresponding transmission;

        means for writing a ghost index into at least one of the locations in the queue; and

        means, if the accessed location in the queue contains a ghost index, for freeing the
accessed location and for rewriting the ghost index in the queue at a random distance
from the accessed location.